

CJ Sub E1) 14. (Thrice Amended) The method of Claim 31 wherein said solvent rinse is simultaneously carried out in the presence of megasonic or ultrasonic energy, heat, ultra-violet radiation, or laser energy.

CJ Sub E1) 18. (Thrice Amended) The method of Claim 31 wherein said post-rinse physical treatment is selected from the group consisting of further exposure to heat, ultra-violet radiation, laser energy, kinetic energy, high-pressure deionized water sprays, physical scrubbing, CO₂ snow processing, ultrasonic and megasonic sound energy.

CJ Sub E1) 20. (Thrice Amended) The method of Claim 31 wherein step (b) further comprises subjecting said organic coatings, films, layers, or residues to simultaneous exposure to a component selected from the group consisting of other chemically active process gases and vapors, chemically inert process gases, vaporized solvents, heat, ultra-violet radiation, and laser energy.

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CJ Sub E1) 29. (Thrice Amended) The method of Claim 25 wherein said pre-rinse physical treatment consists of further exposure to a component selected from the group consisting of heat, ultra-violet radiation, laser energy, kinetic energy, high-pressure deionized water sprays, physical scrubbing, CO₂ snow processing, ultrasonic and megasonic sound energy.

CJ 31. (Once Amended) An improved method for partially or completely removing organic coatings, films, layers or residues from a substrate, said method comprising:

(1) subjecting said organic coatings, films, layers, or residues to a vapor consisting essentially of water-free gaseous sulfur trioxide for a period of time, said substrates being maintained at a temperature in the range from about room temperature to 400°C; and

5 (2) subjecting said organic coatings, films, layers, or residues to a solvent rinse;

wherein the improvement comprises the following steps:

(a) providing organic coatings, films, layers and residues that are selected from the group consisting of polymerized photoresists, paints, resins, single and multilayer organic polymers, organo-metallic complexes, positive optical photoresist, negative optical photore-

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sist, electron-beam photoresists, X-ray photoresists, ion-beam photoresists, ion-implanted photoresists, and other hardened photoresists, wherein said organic polymers are selected from the group consisting of polyimides, copolyimides, polyamides, polyamide-imides, 15 fluorinated polyimides, poly(arylenethers), fluorinated poly(arylenethers), perfluorinated alkylene oxides, parylene (N, C, D, or F type), poly(phenylquin-oxalines), poly-naphthalene, poly-fluorinated naphthalene, benzocyclobutene (BCB), amorphous fluoropolymers, such as polytetrafluoroethylene, perfluorocyclobutane aromatic ether (PFCB), polynorbornene, and fluorinated carbon, and wherein said substrate consists of at least one portion of a device selected from the group consisting of semiconductor devices and wafers, liquid crystal display devices, flat-panel displays, printed circuit boards, magnetic read/write heads, thin-film 20 read/write heads;

(b) subjecting said organic coatings, films, layers, or residues of step (a) to a precursor chemical or physical treatment prior to step (1) capable of facilitating the reaction of said sulfur trioxide with the organic coatings, films, layers or residues to be removed;

(c) carrying out said step (1) so that said water-free, gaseous sulfur trioxide reacts with said organic coatings, films, layers, and residues to form physically or chemically altered organic material;

(d) carrying out said step (2) to remove said altered organic material from said 30 substrates; and

(e) subjecting said organic coatings, films, layers, or residues to a chemical or physical post-rinse treatment subsequent to step (2) capable of removing any residual organic material from said substrates remaining after said solvent rinse.

REMARKS

Claims 3-23 and 25-31 remain in the application. Applicants have amended Claim 31 as follows:

1. bridging lines 9-10 of original Claim 31, the phrase "either photosensitive or non-photosensitive organic materials and" is deleted, leaving the balance of the definition ("selected from the group consisting of ...") to define the organic coatings, films, layers and residues;